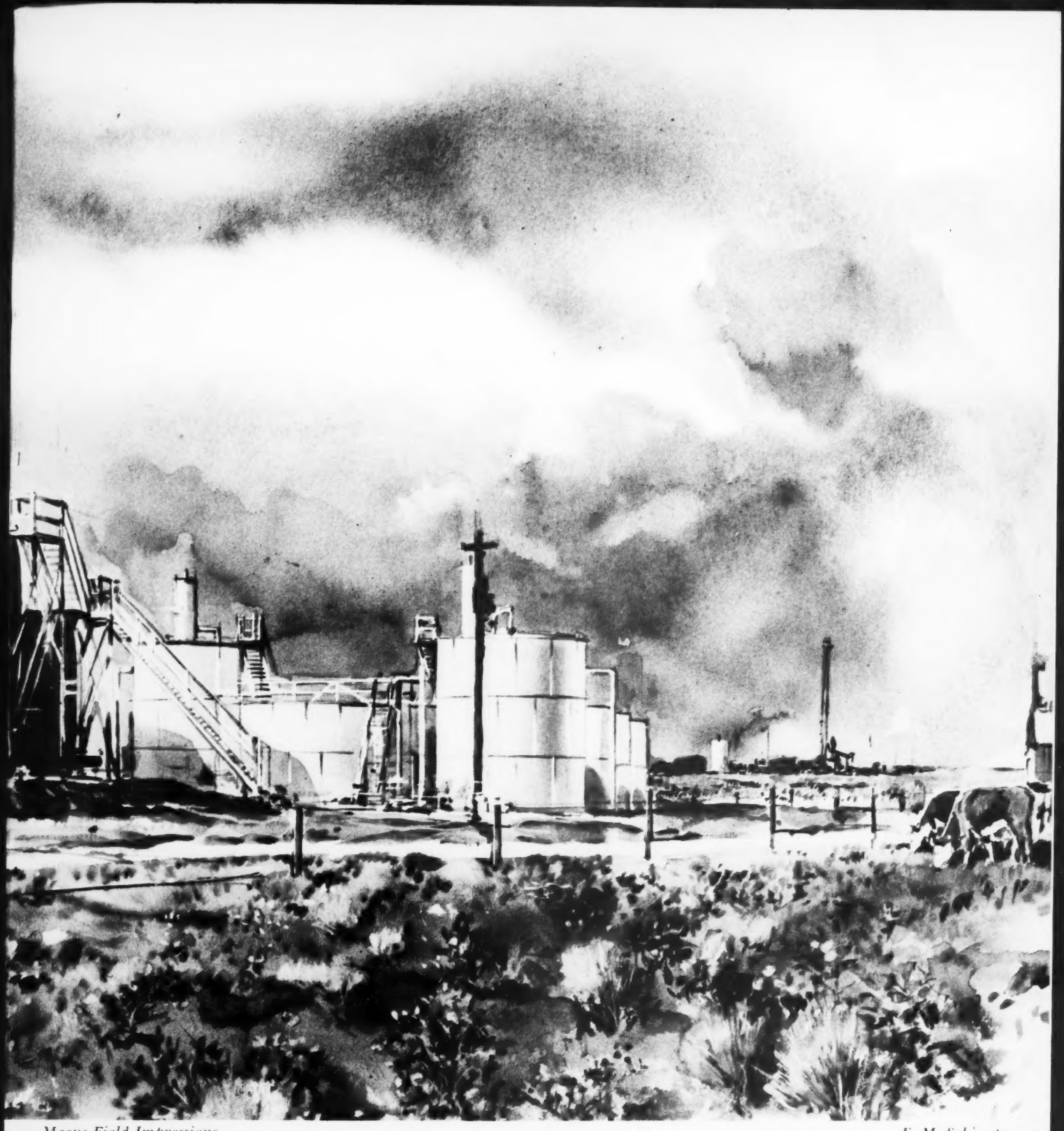


Means Field Impressions — *E. M. Schiwetz*

The Humble Way

NOVEMBER-DECEMBER, 1956

Graceful bends of pipe and a flare stack towering against a Texas sky make an interesting camera study of a Baytown Refinery scene.

The Humble Way
November-December, 1956
Vol. XII No. 4

How Deep Can We Go?

By C. E. Reistle, Jr.
Director and Vice President

"How deep can we go in our search for oil?"

That question has taunted oil men since Col. Drake's 69-foot well at Oil Creek, Pennsylvania, gave birth to the petroleum industry in 1859.

During the 97 years since then, apparently no one has cared to offer a firm answer, for the industry's literature reveals sparse evidence of a positive belief that a maximum depth had been reached. In fact, each generation of oil prospectors has dared to probe deeper, and each generation has crashed established depth barriers before they could find a firm place to stand in the record books.

Admittedly, progress in deep drilling was slower during the first 50 years of the industry's history than it has been since, but what the pioneers lacked in accomplishments they made up for in imagination. Witness this burlesque announcement in the Oil City *Typographical Advertiser* of January 1865:

"Antipodal Petroleum Company, capital stock $1,000,000,000; shares, par value, $10,000 each. Price $25. The well is drilled entirely through the earth extending from Oil Creek, Pa., to Hoang Ho, in the Celestial Empire, and consequently has a double outlet. An immense blow pipe will be inserted in the Chinese outlet to promote an unbroken flow of oil from the western well, which, it is supposed, will be equal to 100 barrels of refined petroleum per minute . . ."

"Ridiculous," you say. Certainly it was ridiculous, but not much more so than would have been the oil man of 1931 who dared predict that in 1956 a well would be drilled to 22,570 feet and would produce oil in commercial quantity from a sand at 21,443 feet. For in 1931 no well had been drilled deeper than 10,000 feet and no oil had been produced from as deep as 9,000 feet.

So, today, faced with the reality of the 22,570-foot Richardson & Bass well at Port Sulphur, Louisiana, the industry probably is not much nearer than it ever was to answering the question: "How Deep Can We Go?" Certainly no practical oil man, who, in his lifetime has seen the drilling tools bite

down one mile, then two and three and four miles, is willing to predict that we have reached the maximum. Nor is that same oil man likely to hazard a guess on how deep drillers will be turning bits in the next 25 years.

Oil men by and large are realists; they know the practical limitations, mechanical and economic, which face them. They are also dreamers; they can visualize that the same ingenuity which has driven the bits down to 20,000 feet and deeper might well also drive them down to 30,000 feet and beyond.

Geologic

Even without full knowledge of the hazards involved in such deep drilling, the layman is prompted to ask: "Why try to drill six miles or more into the earth? Do you have reason to believe there's oil that deep?"

No one can answer that for certain, but many qualified geologists believe there is oil at greater depth than we have found it to date.

"If oil was trapped at 25,000 feet a few million years ago—or at 30,000 feet or more—it ought to still be there," geologists figure. And they promptly follow that reasoning with the statement that there is geologic evidence of sedimentary basins (geologic areas favorable for containing oil) at 60,000 to 80,000 feet.

But they didn't always think so. Not too many years back some geologic theories set 18,000-20,000 feet as the maximum depth at which we could expect to find good porosity (adequate minute channels in the rock to allow oil to flow through). The reasoning was that at greater depths the tremendous pressure and weight of the overlying formations would have eliminated good porosity.

Actually, it has already been proved that there is good porosity below 20,000 feet, and there is now strong faith among geologists that we are likely to find good porosity down to 30,000 feet and deeper. This belief depends somewhat on what part of the world we're in, but research points to the fact that in this country there is little increase in density of formations below 8,000 feet.

Granted, then, that porosity is good at greater depths than we have explored, does it follow that oil was ever formed at yet unexplored depths in the earth? Here geologists are again uncertain. They do know that nothing has been turned up by extra deep drilling so far—though admittedly there has been little of it done—that would condemn marine rocks at *any* depth.

There is one geologic authority who has theorized that oil "could occur in sandstones at a depth of more than 65,000 feet and in limestones at more than 51,000 feet."

If that theory is somewhere in the realm between fancy and fact, the limits on deeper drilling rather obviously are not geologic. The continuing need to find new reserves for our oil hungry economy would prompt oil men to assume there may be oil down at those depths.

Our present drilling limits, then, are defined more by engineering and economic problems. How to perfect our technical and mechanical operations so we can go deeper at tolerable cost, that is the question. In the past this has been done by close cooperation between the oil industry, the tool and equipment industry, and the well service industry. Continuation of this joint effort is almost certain to bring about the improvements needed to make deeper drilling possible.

" . . . for the most part the earth's store of oil still remains hidden from us. We have found only the most conspicuous accumulations of oil."— ***Wallace E. Pratt in Oil in the Earth***

Mechanical

Among the products where improvements are necessary is drill pipe. Greater strength is needed in drill pipe. Over the years improved drill pipe has been coming from the nation's leading steel mills, so that the 55,000 pounds-per-square-inch minimum yield strength pipe of 25 years ago no longer meets everyday requirements. Today the standard product is 75,000 pounds, and the pipe industry is supplying 105,000-pound pipe for extra deep wells and is working toward 130,000 to 140,000-pound pipe for the deeper wells of tomorrow.

Like drill pipe, casing and tubing for oil wells need to be improved to withstand pressures and temperatures in excess of those that have been experienced in 18,000-20,000 foot wells.

In certain other mechanical fields the industry is equipped now to handle 20,000-25,000 foot wells. Derricks and drawworks for such depths are available; drilling lines, rotary swivels, drilling hooks and blocks are sturdy enough. But blowout preventers, wellhead controls, and hydraulic horsepower for mud circulation need improvement and further development, engineers say.

Drilling mud also presents some problems as wells go deeper. High temperatures found in extra deep wells tend to make drilling muds jell and solidify. But improvements are constantly being made (including oil base mud), and drilling records to date would seem to indicate that mud will not be a limiting factor in future drilling of deeper wells.

Somewhat similar has been the experience with cement and cementing techniques. Though high bottom-hole temperatures in extra deep wells (as high as 400 degrees already has been experienced) cause problems with today's cement, normal improvements in this product are calculated to keep it out of the problem area.

Finally, there appear to be no insurmountable problems in the field of well servicing. Logging and perforating tools will be able to keep up with deeper drilling, technicians believe, so long as drilling mud can be kept fluid enough to allow the necessary tools to be lowered into the hole.

Financial

The prime stumbling block in the way of deeper drilling in the future, then, would seem to be one of money. If the geologists believe there is oil at greater depths, and they do; if manufacturers and design engineers feel they can master the technical and mechanical problems, and they're making steady progress; then a major consideration is whether or not the economics of such deep drilling would justify the enormous investments necessary to drill the deeper wells.

A prime example of the cost of extra deep wells is the $2.5 million which operators are reported to have spent on the 22,570 foot well in Louisiana this year. That means the well cost

Drilling crews, whose teamwork is vital to deeper drilling, work with derricks, drawworks, other units adequate for 20-25,000 foot wells. They need better muds and cements, drill pipe and casing; improved blowout preventers and well head equipment.

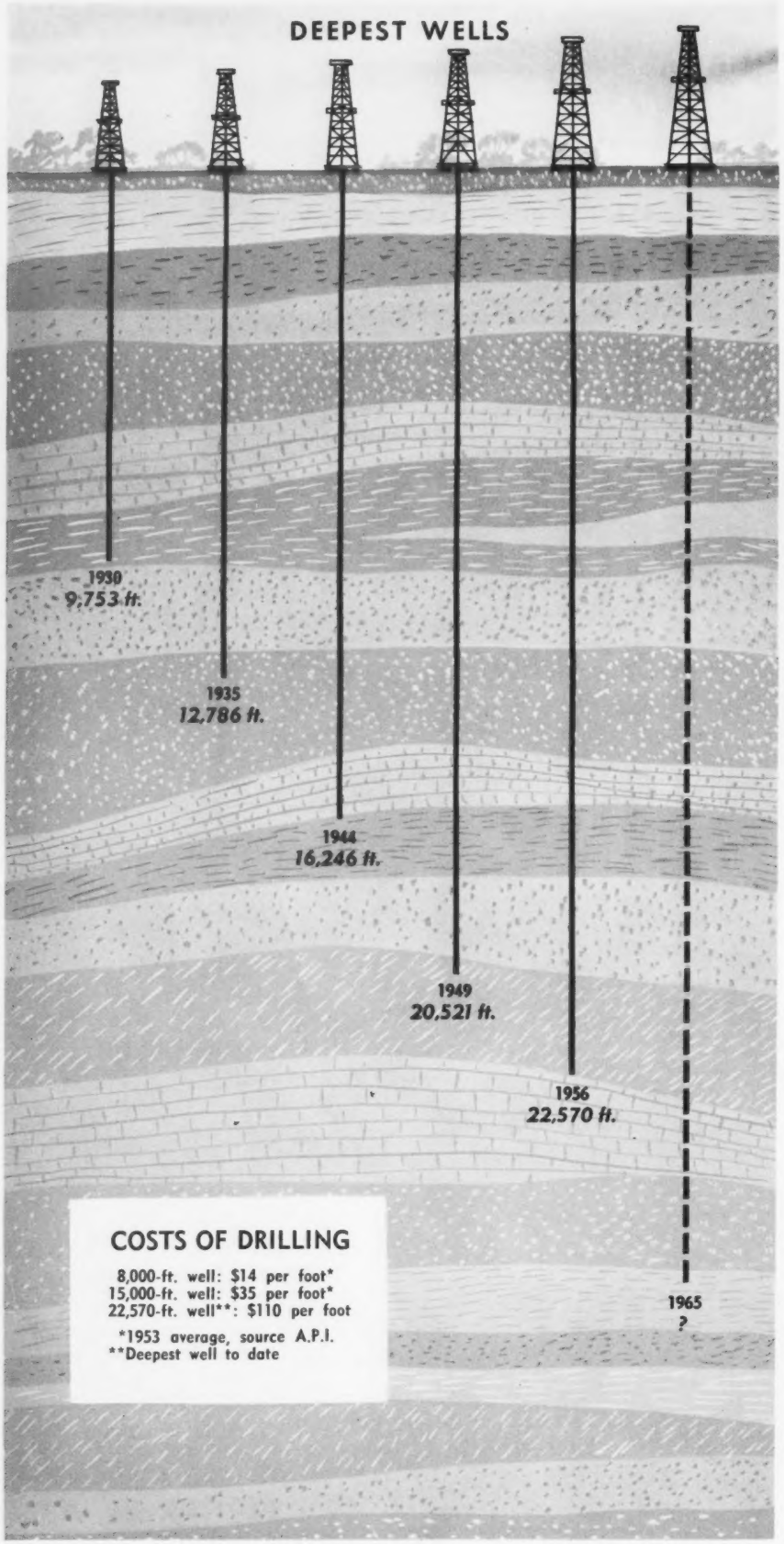


Chart shows how U. S. drillers have pushed their bits deeper during the past quarter century; also how today's drilling costs skyrocket as deeper formations are probed.

$110 a foot, as compared with a normal cost of $14 per foot for an 8,000 foot well and $35 for a 15,000 foot well. The operators might have experienced a complete loss of that money (except for scientific knowledge gained) had the well been dry. But even with a 207-barrel-a-day producer, time required for the paying out of drilling costs only will be more than 11 years, with no consideration for maintenance, operating costs, or interest on capital. Nor is there any assurance that the well will produce for 11 years, or even for five years or one year.

Another way to express the cost of deep drilling is in simple terms of how many feet the industry has to drill to find 1,000 barrels of oil. In 1937, 1,000 barrels of new oil came with each 27 feet of drilling; last year it took 79 feet of drilling to find 1,000 barrels of new oil—almost three times the footage.

In spite of this and in spite of greater costs, oil men see a continuing tendency to drill more deep wells.

A Look Ahead

Scientists in Humble's Exploration Department recently took a 10-year look ahead on this subject. Projections for California and the Gulf Coast Area —exclusive of Oklahoma and Wyoming (two deep drilling areas where Humble does not operate) are as follows:

There will be an expected 90 per cent increase in *deep* wells (10,000 feet and deeper)—from 2,301 in 1956 to 4,043 in 1965.

There will be an expected 600 per cent increase in *deep deep* wells (16,000 feet and deeper)—from 47 in 1956 to 332 in 1965.

There will be an expected 1100 per cent increase in *extra deep* wells (18,000 feet and deeper)—from seven in 1956 to 82 in 1965.

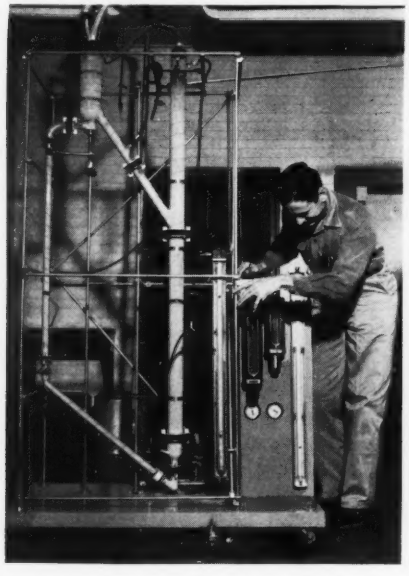
All of which seems to indicate that investors and oil industry managements are keeping pace with geologists who believe oil is present at great depths and with engineers who believe the mechanical and technical problems can be solved. These facts point to a continuing trend to drill deeper and deeper wells in the years ahead.

How deep will the bits finally go? That remains to be seen, and will be determined in a large measure by the success or failure of efforts over the next 10 years.

Kitty cracker, miniature of Baytown refinery's largest unit—the cat cracker—towers over pilot plant area in five-story building at right. Far in background stands 18-story cat cracker itself; real name: fluid catalytic cracking unit.

WHERE BRAINSTORMS GET THE ACID TEST

Pilot plants are miniature units bridging the gap between test tube and huge refinery tower



Glass model duplicates functions of kitty cracker on still smaller scale.

WHEN Junior gets that electric train or Erector set for Christmas, Father may smile and sheepishly admit to ulterior motives. But for a group of grown men at Baytown refinery, tinkering with scale-model miniatures is serious business.

These men are research engineers and scientists. Their models are called pilot plants. Because of these men and their pilot units, new products appear and old products are improved. Because of them, trial-and-error research is not the expensive blind alley it once was. Because of them, the refinery skyline is continually changing.

Exactly what is a pilot plant? How big is it? What does it look like? How does Humble use them at Baytown?

Broadly, a pilot plant is any miniature production unit that paves or "pilots" the way to production on a regular scale. At Baytown, they are the half-way house between the laboratories in the Research Center and the massive units making up the refinery front line—the intermediate step between the test tube and the 24-hour-a-day, full-scale units.

Pilot plants come in a variety of sizes and shapes. One of Humble's smallest is a three-year-old automatic unit which evaluates catalysts (substances which speed up chemical reactions). It would fit in the trunk of your automobile.

The largest is appropriately called a "kitty cracker." Housed in a building five stories tall, it is a model of the refinery's largest unit, the "cat cracker" or catalytic cracking unit. Actually, Humble has two cat crackers at Baytown; one is 21 stories high (by far the tallest structure in Baytown), the other is 18.

Pilot plants don't always look like their plant-sized counterparts. But they operate exactly the same. The kitty cracker, for instance, processes five barrels of gas oil daily. The 24-hour capacity of its big brother, the cat cracker, is 55,000 barrels. The heart of the kitty cracker is a vessel four inches in diameter. The corresponding part in the cat cracker is *42 feet across!*

The only common denominator of pilot plants is their concept and purpose. The pilot plant idea—"look before you leap"—is as old as man himself, though industry has used it as a major research tool for only a quarter-century. In a way, the space satellite to be launched in 1958 is a pilot plant. But one Baytown scientist likes a more down-to-earth example:

"Once in a while my wife tries a new recipe. Experimental, you know. If the kids and I survive, she pulls it on dinner guests. That's a pilot plant idea."

Take an actual Humble case study—one involving an ordinary ice cream freezer. In 1948, Humble researchers were feverishly trying to separate an oil compound called paraxylene from one of the products streams. Study by others had shown that "Dacron," a new and improved synthetic fiber, could be made from paraxylene and woven into a washable, wrinkle-resistant cloth.

First the research men tried to boil off the crystals. That failed. Then they injected chemicals they hoped would pry paraxylene away from other members of the close-knit -xylene family. To no avail. Finally a "freeze out" tactic worked—and here's where the ice cream freezer came in. After the side-winding crank had been turned some time, and the temperature lowered, the paraxylene crystals fell out. The freezer had acted as a pilot unit *for* a pilot unit.

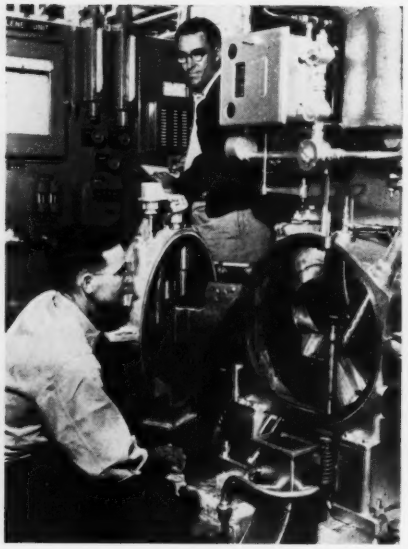
Humble research men now *thought* they had the answer—but scientists, like courts of law, insist on proof. The freeze-out technique was only circumstantial evidence; it was too expensive to put into full-scale operation without further testing.

A paraxylene pilot plant was the result. The first batch of the crunchy, snow-like crystals weighed 50 pounds—and a customer was waiting. A few months later, when minor "bugs" were eliminated from the process, a large unit was installed in the refinery. Today it turns out 85,000 pounds of paraxylene every day, 31 million pounds a year. You might be wearing some of it in the form of "Dacron" at this moment.

Pilot plants, then, make it possible to keep mistakes down to pint size. C. F. "Boss" Kettering, dean of American research geniuses, sums up this advantage neatly: "The pilot plant is the bridge across the shirt-losing gap between lab experiment and plant production."

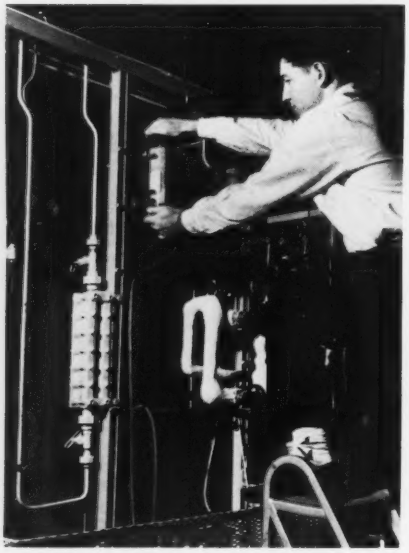
Because of competition among refiners, work in the pilot plant area goes forward under a tightly drawn cloak of security. Few visitors would understand what's going on even if allowed to roam freely in the eight-

Ice cream freezer was used in attempt to isolate paraxylene for new fabric.

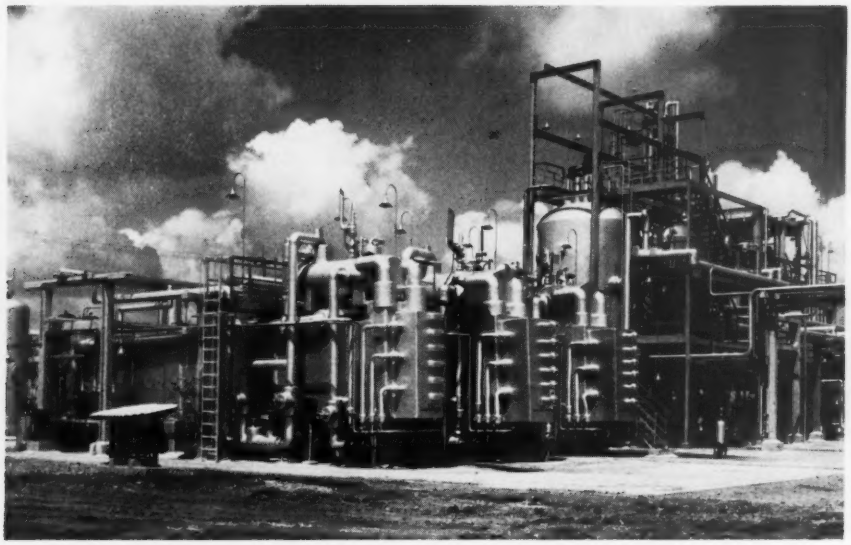


To further test "freeze out" process, research engineers built pilot unit.

Small pilot plant, catalyst evaluator, tests the nature of chemical reactions.



New pilot unit, aromatic alkylation unit, splits, regroups oil molecules.



Finally, this full scale paraxylene plant started operating 18 months later; it produces many tons of the frozen crystals yearly for making synthetic fabric.

building area. Even if Humble tour guides gave detailed explanations—which they don't—only the scientifically trained would "savvy." As it turns out, you get information couched in courteous generalities about research on such everyday items as synthetic fabrics and plastics.

But even the most casual visitor can feel a sense of urgency here: pilot units are constantly being changed, improved. "Status quo" is a foreign word; there's no mistaking the purposeful air with which men go about their duties. But all the problems can't be solved in the pilot plant stage—just as they can't all be solved in the test tube. So full-scale units are sometimes built without assurance they'll pay their way.

"It's a big risk," says one scientist, "but that's Humble's policy of leadership. And we research people stay in step."

Staying in step is a job not only for the scientists who conceive pilot plants, and the engineers who design them, but for the men who run them—the pilot unit operators. These 25 men are expertly trained in the operation of delicate equipment. They are, in effect, co-pilots for pilot units. They are confronted with all the problems of the big units—and more.

In any experimental process, mistakes come thick and fast at first. But special care must be taken with pilot plants because even a small error is highly magnified in a unit hundreds of times larger. Variations of an ounce of pressure or a fraction of a degree of heat may throw one completely off specifications in the plant-sized unit. In addition, some "bugs" just won't show up in pilot plants on a small or short-term basis—such things as corrosion and metal fatigue.

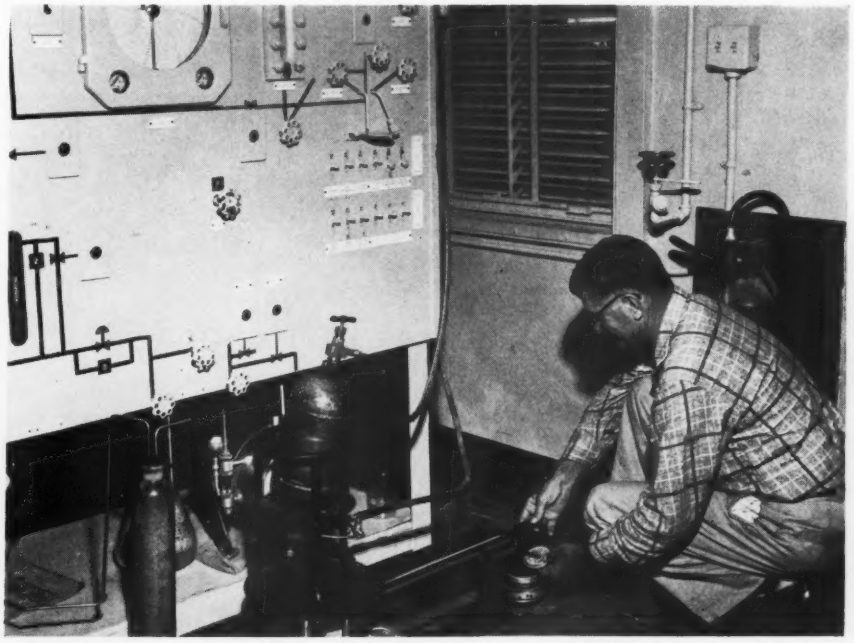
Occasionally, the pilot plant procedure is reversed: the large unit is built first, the pilot unit later. Strong competition sometimes forces Humble to risk loss by introducing a unit on a plant-sized scale. When this happens, a pilot plant replica usually is built to improve the process further.

Time was when a crackpot inventor could spend a lot of your time and money before you discovered his idea was a hoax. That time is past. With pilot plants, the oil industry and others are able to evaluate ideas thoroughly—and early. Pilot plants truly are the place where brainstorms get the acid test.

Humble's formal pilot plant program started in 1935. That year, the first operator was assigned to a vest-pocket sulphur-dioxide extraction unit. From fractions of crude oil, the unit obtained material for use in blending aviation gasolines and making solvents for the paint and lacquer industry. Between then and now, Humble has operated more than 100 pilot units.

All these pilot plant projects didn't produce the desired results, of course. But Humble research scientists and pilot unit operators take a philosophical attitude. They remember that Thomas Edison didn't disparage the lack of results after 50,000 failures on a new storage battery.

"Results!" exclaimed Mr. Edison to an assistant; "Why, man, I have gotten lots of results. I know 50,000 things that *won't* work."



Versatile pilot plant is this process testing unit, one of three in service at Baytown; it can be set up to diagnose, prescribe for many ailing refinery units.

Drifting sand dunes and shin oak-covered plain surround this pumping well in Means field—home only to hearty animals and heartier oil men.

The

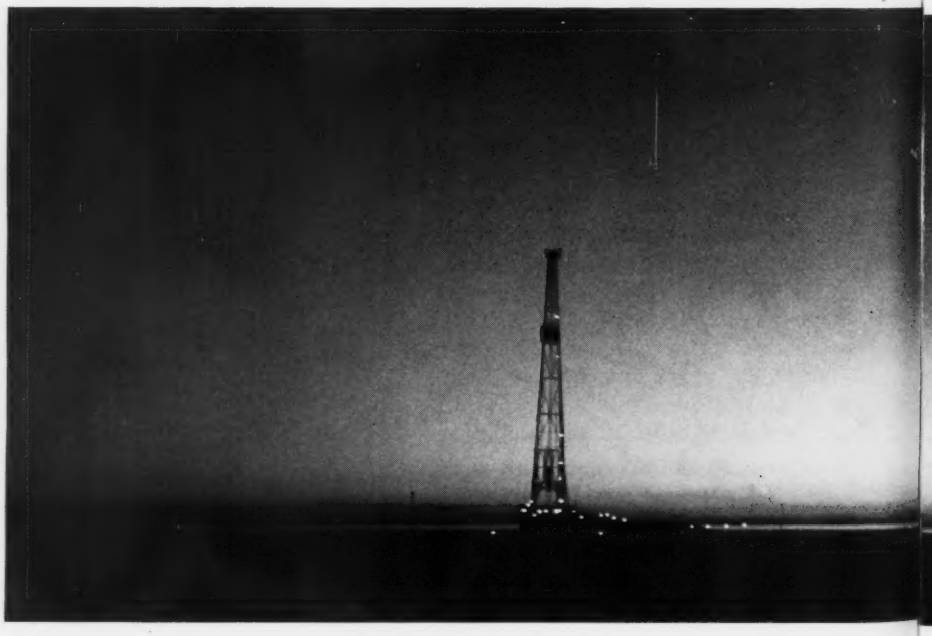
CHOOSE one of the busiest oil regions in the United States. Then focus still closer, to pinpoint the real beehive of activity. When you do that, you've got the Means field in Andrews County, smack in the heart of what oil men call the Permian Basin.

The Means block, named for father and son ranchmen J. S. and R. M. Means, is a sandy strip of Texas soil beginning near Andrews (county seat and only town; named for the first soldier killed in the Texas Revolution) and extending north about twelve miles. It is also the working home of 180 Humble employees and the spot where the Company has marked "X" for its most extensive drilling program in 1957.

With effort, this three-by-twelve mile rectangle (see map) sustains scrubby shin oak and mesquite, a few bony jackrabbits and an occasional coyote. In bygone years, when rain wasn't such a rarity, buffalo and antelope fed here on a sea of grass. Now, this is the land of the "dust devil" and the itinerant sand dune, where unpaved roads must be scraped continually to keep them passable. Against this backdrop, Means District camp, with its incongruous clumps of Chinese elm, is a lonely oasis.

The Means story is the story of an oil field that wouldn't give up. In a way, its story is the old one of the tortoise and the hare. Neighboring fields sometimes excited oilmen by blossoming quickly, then disappointed them by fading fast. Means was more of a steady plodder. For 22 years, it moved doggedly along, having its ups and

Map shows Means block as rectangle lying in general north-south direction.



Dawn in Means field silhouettes the old and new; a 20-year-old pumping well contrasts sharply with lighted drilling rig at work just before sunrise.

e Means Field

New productive zones and new techniques rejuvenate this twenty-year old field into a major West Texas producer

downs but always managing to move ahead. Now, through new strikes both above and below original discoveries, and technological advances—such things as formation fracturing, electric logging and improved sample analysis—it has matured into one of the Company's most valuable West Texas blocks.

First, though, what's this Permian Basin? How has Humble helped transform this panoramic wasteland into a productive oil area? And what's the future of Means?

The Permian Basin of today is underground—visible only in the mind's eye of the geologist. Its true limits are a matter for debate, but the main oil-producing belt includes 33 Texas counties and two in New Mexico. Of these, Andrews County, the home of Means field, was 1955's leading producer.

But we're getting ahead of our story. Let's go back to 1920, when the first Permian Basin oil was struck on a site near Westbrook in Mitchell County. A banner headline in the Colorado City *Record* screamed: "Oil, Oil, Rumors of Oil!" But the Westbrook boom proved no more than a cork-sized pop. It took discoveries at Big Lake, three years later, and at Yates Field in 1926 to turn the head of the infant Texas oil industry from the Gulf Coast.

The eight-year-old Humble Company moved westward in 1925 with the first major pipe line in the Permian area. The next year a Humble refinery was built at McCamey midst a mecca of oil activity; the same year Humble Pipe Line Company laid another line—this time from West Texas to Ingleside near Corpus Christi.

Humble became interested in the Means area as early as 1928, when another company abandoned J. S. Means No. 1 in the shallow Yates sand. Noting conditions favorable to oil traps, Humble geologists encouraged leasing of land. In March, 1934, the R. M. Means No. 1 test well was spudded in in the northern half of the Means rectangle. Five months later, on August 19, it came in. A Humble drilling crew completed the well at 4,472 feet; it tested 350 barrels per day. Geologically, this discovery well hit paydirt in a mid-Permian zone christened the "Big Lime."

In earlier times, these trackless sand dunes had sold to sheepmen for as little as 25 cents an acre. Now, this drab plain had pulled the Cinderella switch; the oil men's glass slipper fit the Means foot.

With the Means strike, Humble's

Side by side sit two Means wells producing from separate zones. Gauger opens valve on Queen well; the pumper at right is producing from the "Big Lime."

Western Division was on the way to becoming the big crude oil producer it is today. Though it lies under some of the emptiest real estate on this continent, Means has produced a 22-year total of 30 million barrels. And that doesn't include complete figures for 1956, the peak year thus far. Humble's 375 wells are now producing about 12,800 barrels per day.

The 22 years between 1934 and 1956 saw great fluctuations in production and development. Before 1941, drilling was rapid. From 1941-46, development was slight, reflecting wartime restrictions. A drilling surge followed from 1946-49 due to increased demand for crude oil. But this fell off sharply late in 1949; there was a general lack of drilling incentive because of a low field allowable.

Means area's big rejuvenation came in 1954. It was the result of many factors, but four chief ones were: (1) Discovery of the new Queen sand, (2) formation fracturing, a new method which opened up areas considered nonproductive, (3) discovery of the Wolfcamp, a new and deeper pay zone, and (4) a new field allowable, justified by reservoir studies.

A recent chapter in the Means story is development of the Queen sand. This wafer-thin horizon rests about 200 feet *above* original discovery zones. Humble geologists early noticed oil stain at about 4,000 feet but to them, the Queen potential seemed poor. The formation was so hard, the oil content of the rock so low, that economical completion and production would have been impossible in the early years. It's doubtful, in fact, that the Company would have kept its leases on the strength of the Queen sand alone.

The Queen was belatedly crowned as an oil-producer in 1954. A vigilant production geologist sitting on a Means well got curious about cuttings from the Queen zone. This, he reasoned, might mean oil. Sample analysis in the Midland labs confirmed his hopes. As a result, a test well was drilled; and with formation fracturing, it tested 380 barrels of sweet crude a day. Ironically, the discovery well of the Queen, bypassed for 20 years, is within a stone's

Queen sand discovery well is within shouting distance of Means District Camp, background. It was completed with aid of formation fracturing.

Working over old wells is the biggest activity in Means production district. Here, Humble crewmen help complete one of this year's 73 workover jobs.

throw of Humble's Means District Camp.

Formation fracturing, the process that helps bring in many a tight West Texas producer, made Queen development possible. This formation-splintering technique, perfected a few years earlier, was first used in 1953 at Means. In brief, you pump large quantities of a sand-laden liquid into the reservoir at high speeds. The oil-holding rock is fractured, its pores better exposed; the sand stays behind to hold the cracks open.

Means area got another boost in 1954 from an oil zone called the Wolfcamp. The lowest producing layer of the Permian, at 9,000 feet, the Wolfcamp is an elongated trend in a north-south direction. This oil band might extend eight to nine miles—almost the full length of the Means block. Still, the potential of the Wolfcamp is highly speculative; only nine wells have been completed.

Drilling into still deeper formations is underway. Three Ellenburger test wells were dry, but all were completed in the shallower zones. One of these is the deepest test well yet drilled in the Means field; it went to 14,350 feet.

The lifespan of an oil field, like that of a human, is hard to predict. It might last another 100 years; it might begin to dwindle day after tomorrow. Who knows? Perhaps deeper drilling will find new oil at Means. Or maybe—such as in the Queen—we'll be able to release oil tomorrow that we're drilling through today.

Another tentative chapter of the Means story is in the draft stage right now: wide-scale pressure maintenance studies are being made to keep Means alive as long as possible. At its present rate of production, Means should be a producer at the turn of the century.

The first white man seen around the Permian Basin, they say, was a barefooted antelope hunter named Lum Medlin. You can't help but imagine that if Lum were around today, he'd sit down on a sand dune, pick the grassburs from a leathery foot and marvel at the changes in his old hunting ground.

Means District Camp, three miles north of Andrews, is welcome oasis in midst of arid West Texas. Columns of Chinese elm shade neat Company homes.

Working with HUMBLE

The Helicopter Highroad

MEMBERS of a Humble drilling crew disembark from a helicopter onto the flight deck of a converted LST tender. Suitcase in hand, each man is ready for a 40-hour tour of duty on location in the Gulf of Mexico off Grand Isle, Louisiana.

In earlier years, boats moved men back and forth. But boat trips proved slow and expensive. In bad weather, men often arrived at home or on the job a bit "green around the gills."

Helicopters changed all that. Over the routes that used to take hours by sea, versatile whirlybirds whisk men to and from work in a matter of minutes—with rarely a case of midriff butterflies.

The airlift began modestly in 1954, with one helicopter making twice-a-day runs. It has been expanded to keep up with drilling operations. Today, Humble uses 11 helicopters and flies a tight ferry schedule. Flights and number of passengers hauled will increase in 1957, when two more helicopters will be added.

N745A

WARPATHS OF

The worst series of Indian wars that ever blazed across Texas began, strangely enough, with a Comanche plea for peace early in 1840

OF ALL internal troubles that plagued Texas during its decade as a republic, none was more pressing than the Indian problem. Not even heads of state could agree on the best way to cope with it.

President Sam Houston, who had lived with the Indians and knew their ways, advocated a "peace if possible" policy. His successor, Mirabeau B. Lamar, piped a more popular political tune. The only good Indian, he argued, was a dead one . . . or at least one removed far beyond the republic's borders.

It is not surprising, then, that during Lamar's administration a spark was struck which kindled the worst Indian wars that ever blazed across Texas. And it all began, strangely enough, with a Comanche plea for peace.

Early in January, 1840, three Comanches entered San Antonio on a singular mission. Their people, said they, had agreed in general council to ask the whites for a treaty. Col. Henry W. Karnes, Commandant, heard them out but doubted their intentions. No treaty could be considered, he said, unless the Indians would release white captives, restore stolen goods, and deliver future troublemakers to the Texans for punishment. These things, the emissaries assured Karnes, were agreeable to their general council. They would send a delegation to San Antonio in a month or so to talk over the terms of the treaty.

No sooner had his guests retired than Karnes penned a recommendation to Albert Sidney Johnston, Secretary of War. If the Indians meant what they said (which he doubted), Karnes was for setting up a commission to meet them. But he advised Johnston to send enough soldiers to handle any trouble that might come up. It sounded like good advice, and Johnston gave orders accordingly.

On March 19, a group of 65 Comanches, including squaws and children, rode up to the appointed meeting place in San Antonio. Their leader, old Muguara, took a dozen chiefs with him inside the council chamber to meet a group of Texans under Commissioners William G. Cooke and Hugh McLeod. A group of Comanche warriors remained outside in an open yard with their women and children.

If the presence of armed infantry stationed nearby gave the Indians any cause for alarm, they failed to show it. Confident that they were on a peaceful mission, they relaxed and enjoyed their leisure. For a time, it was reported later, small Comanche boys amused a white audience by shooting arrows at a target.

Inside the council room, things got off to a bad start. Muguara and his companions had brought with them only one white prisoner, a young girl named Matilda Lockhart. Referring to this apparent evidence of bad faith, one commissioner asked the chief, "Where are the prisoners you promised to bring in to this talk?"

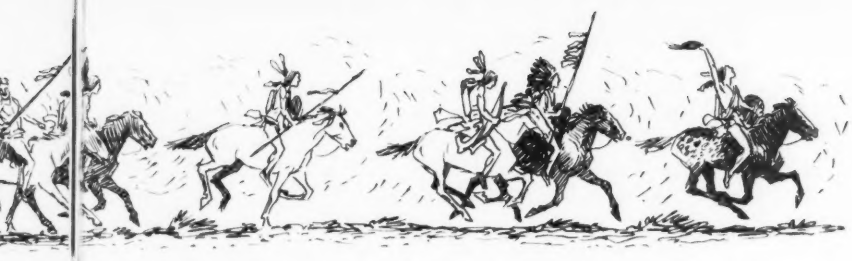
Muguara replied, "We

". . . It is the violation of treaties, and the bad faith of the white man and his aggressive course, that cause the inquietude of the Indian . . ."

. . . Sam Houston

"As long as we continue to exhibit our mercy without showing our strength, so long will the Indians continue to bloody the tomahawk . . . The white man and the red man cannot dwell in harmony together. Nature forbids it."

. . . Mirabeau B. Lamar



F THE REPUBLIC

have brought in the only one we had; the rest are with other tribes."

No one will ever know whether Muguara told the truth. He may have told the truth as he saw it, for the Penateka Comanches traveled in many separate bands, each band more or less independent of the other. His own following was comparatively small, and Matilda Lockhart could have been the only captive he held directly. But according to Matilda's testimony, she had seen several prisoners at the principal camp only a few days earlier. The Indians intended, she insisted, to bring the prisoners in one at a time, in the interest of squeezing out a greater total ransom.

An awkward and ominous silence fell upon the room while the Texans pondered the situation. Then Muguara, referring to his first statement, asked insolently, "How do you like the answer?"

The commissioners replied by giving Capt. George T. Howard a discreet signal to bring his company of infantry into the room. Even then, for a short time, talk was resumed and peace terms were discussed. The Indians admitted they had violated previous treaties, but haughtily demanded they be given another chance to bring in prisoners.

This was a chance the commissioners did not intend to give them. With soldiers posted around the room, the Indians were told they were prisoners and would remain so until all white captives were delivered. Placing the military in charge, the commissioners rose to leave the room.

Anyone who knew Indians could have predicted what would happen next. Prison to a Comanche was worse than death. One of the chiefs sprang forward in a dash for the door. When a sentry blocked his way, the Indian drew a knife and stabbed the soldier.

Across the room, Capt. Howard blocked a similar attempt to escape and received a severe knife wound in the side. Instantly the council room became a battleground, with wild war cries barely heard above the blasts of firearms at close quarters. The Indians fought desperately, but knives and bows proved no match for rifles and pistols. In a few minutes, Muguara and his chiefs lay dead.

In the yard outside, warriors battled another infantry company in furious hand-to-hand fighting. Even the squaws joined their men, "fighting like female tigers," according to one report of that day. Led by Capt. Redd, the soldiers forced the Indians to take cover in some buildings nearby. From here, they made a determined stand, using their bows with good effect. Whenever an arrow found its mark, noted an eyewitness, it was "driven up to the feather."

After a time, a few surviving braves made a dash for freedom, only to be run down and killed by cavalry under Col. Lysander Wells. One renegade Mexican, who had accompanied the Comanches, managed to escape. Only one warrior remained alive now, and he had barricaded himself securely inside a stone-walled room. Soldiers literally smoked him out by setting fire to turpentine-soaked rags and dropping them through a window into his room. Gasping and blinded, the lone survivor charged outside. He had barely crossed the threshold before he fell, riddled with bullets.

With the fighting over, a battlefield count revealed that the Comanches had lost all their fighting men—30 warriors and chiefs. In the confusion of battle, three squaws and two children had also been killed. The rest—27 women and children, plus two old men—were taken prisoner. The Texans had lost seven killed and had eight wounded.

Later, one of the squaws was sent back to her people with demands that the other prisoners be brought in. She was never seen or heard from again. It was reported that the Comanches, furious over what they considered a massacre of their people, killed more than a dozen white prisoners.

The Council House Fight, as it came to be known, proved to be a grave blunder. From that time on, furious over what they considered a massacre of their people, Comanches would never repose trust in white men. And if Texans

expected to fight to "teach the Indians a lesson," they did not know their Comanches. Less than six months later, war parties would leave a trail of fire and blood across the republic. Already, high on the trackless plains, they mourned their dead and plotted revenge.

In late July or early August, the Comanches completed plans for a full scale attack on the settlement. Braves leaped in the war-dance and passed around the war-paint. Warriors sharpened knives and lances, tested bows, and filled quivers with new-made arrows. At their chiefs' command, a great war party, variously estimated at 400 to 1000, skirted west of the main settlements and struck southward toward the Gulf Coast.

Grim news of the invasion first reached the Texans after a party of Indians jumped two white men riding toward Gonzales on the Columbus-Gonzales road. One they caught and killed. The other escaped, sounded the alarm, and sent couriers to warn the settlements. Men leaped to arms at Gonzales, Hallettsville, and other towns, and rode out to pursue the invaders. Merging their forces above Victoria, the avenging Texans rode toward that city under leadership of John J. Tumlinson.

But the Comanches had too much of a head start. Raiding Victoria on August 6, they met stiff resistance and withdrew after killing 13 people. On the following day, after another attack on Victoria, the war party pushed on toward Linnville, on Lavaca Bay. En route, they took two white prisoners, a Mrs. Crosby and her child.

In the early morning light of August 8, people at Linnville were surprised to see a half-moon-shaped mounted force bearing down upon the town. At first, believing it to be a caravan of Mexican traders, no one gave the alarm. For some, that was a fatal mistake. Only at the last minute, by frenzied flight and good luck, did most of the whites save themselves by taking to boats in the bay. In the town, the Indians killed five people, including Major H. O. Watts, collector of customs. His wife they took prisoner.

While survivors watched from their boats, the Comanches looted, burned, and slaughtered in an orgy of destruction. Houses were put to the torch one at a time, as if the savages relished their work and wished to draw it out as long as possible. When the carnage was complete, warriors and chiefs amused themselves by trying on the white man's finery—frock coats, stovepipe hats, and other clothes stolen from homes and warehouses. Into their horses' tails and manes they plaited gay streamers of bright ribbons and calico cloth.

Finally, after dark, the Comanches withdraw, leaving Linnville in ashes. Survivors returned to shore the next day and buried their dead. Linnville was never rebuilt.

En route to their plains homes, the booty-burdened Comanches on August 9 ran into the Texan force which had pursued them toward Victoria. The whites, since they were few against so many, debated the wisdom of a headlong attack. Ben McCulloch and others favored a quick charge. Tumlinson wavered about giving the order. In this time of indecision, the Indians slipped away.

Battle of Plum Creek

By now, everyone in the settlements knew the Comanches were on the warpath. Groups formed hurriedly to intercept them on their return trip. Some 22 men under Lafayette Ward rode from the Lavaca country to Gonzales and joined forces with 37 more under the famous Indian fighter, Capt. Mathew Caldwell, known across the frontier as "Old Paint."

While Tumlinson's men followed the Indians in hot pursuit, McCulloch and three others dashed off to join "Old Paint," who was hastening to intercept the Indians and who had reached Seguin by sunrise on the morning of the 10th. Here a courier rushed up with the news that the war party had been sighted following the same course it took southward. Accordingly, the Texans rode to Plum Creek (near present Lockhart) and pitched camp, certain that the Comanches could be intercepted there. Although Tumlinson's men did not reach the scene in time for the fight, other reinforcements began to pour in to the Texan camp.

About 30 men under Capt. James Bird rode up from Gonzales. The problem of command grew a bit awkward when General Felix Huston, of the militia, entered camp. Caldwell was the better Indian fighter, and all knew it, but it was Caldwell himself who suggested, diplomatically, that Huston take command.

The Comanches and more support for the Texans arrived at Plum Creek on the same day—almost at the same hour! Just before sunrise on August 12, Texas scouts reported the Indians were only three miles away, still unaware of the ambush that had been set for them. Another courier reported that Col. Edward Burleson with about 87 men and a dozen or so Tonkawa allies were also near, rushing toward the Texan rendezvous. These reinforcements had barely reached the camp, panting from their ride, when the main body of Comanches was sighted, moving leisurely across open prairie.

The Council House Fight

After the Massacre

One end of the Indian line had just entered a point of woods when Huston and his men sprang into action.

At a signal, the Texans charged from the brush and rode out to meet the Comanches. As was customary, both sides prepared for battle but neither chose to charge at once. Instead, battle lines were drawn and individuals on both sides put on shows of horsemanship and daring. It would not have been unusual for a fighter on either side to ride forth and issue a challenge for hand-to-hand combat, as a prelude to battle. This happened on many another occasion, but there is no record of it at Plum Creek. Instead, one chief, wearing what has been described as an "enormous headdress," tried to steal the show with a display of daring horsemanship. Riding well within gunshot, he taunted the Texans. In his recklessness, however, he drew too near and a frontier marksman toppled him from his horse with a well-placed shot. Immediately, on Caldwell's advice, Huston ordered a general attack. In his report, written later that day, he tells the story:

> ". . . I ordered Col. Burleson . . . to move around the point of woods, and Capt. Caldwell . . . to charge into the woods; which movements were executed in gallant style. The Indians did not stand the charge, and fled at all points. From that time there was a warm and spirited pursuit for 15 miles . . .
>
> ". . . Upwards of forty Indians were killed. Two prisoners (a squaw and child) taken; and we have taken upward of 200 horses and mules, many of them heavily packed with the plunder of Linnville and the lower country . . . Of all the captives taken by the Indians below, we have been only able to re-take one (Mrs. Watts of Linnville) and she was wounded by Indians with an arrow when they fled. Mrs. Crosby was speared, and we understand that all the others were killed. We have lost one killed and seven wounded—one mortally.
>
> "To conclude, I believe we have given the Comanches a lesson which they will long remember . . ."

At his headquarters in Austin on September 28, Huston revised his first reported figures of the battle. He raised his estimate of the Indian force to about 600 and reduced his own to 186. The estimate of Comanche dead he increased from forty to "upwards of eighty," not counting a great number presumed to have died later of wounds.

Not satisfied with their smashing victory at Plum Creek, the Texans planned a campaign against the Comanches which would destroy the Indians in their homeland. During September, Col. John H. Moore called for volunteers, and response was prompt and vigorous. Around the first of October, Moore left Austin with about 90 men and a dozen or so Lipan guides.

For days, the expedition pushed northwestward, following the course of the Colorado River. At a point some 275 miles from Austin, near what is now Colorado City, scouts reported a large village about 15 miles ahead. The camp, they said, stood on the bank of the Colorado where the river made a large bend. On the opposite side rose a high bluff. In this, Moore saw the makings of an effective death-trap.

Advancing under cover of night to a point near the camp, Moore stationed one group of men at the top of the bluff. With the others, he moved forward to attack the Indians from across the river. He almost caught them by surprise; at the last minute, a sentry heard hoof-beats and sounded the alarm. As the Texans charged into camp, warriors scurried for weapons and turned to make a desperate stand.

In the confusing half-light of approaching dawn, and in the furious swirl of hand-to-hand combat, it was knife and bow against rifle and pistol. And it was hot fighting while it lasted. But the Comanches were doomed and they knew it. Many fell into Moore's well-set trap by attempting to swim the river and escape up the bluff on the other side. Some of these were shot in the water; heavy fire from above toppled others backward as they struggled up the bluff.

When the battle ended, Moore and his men counted 130 dead Indians. Only two warriors had escaped; squaws and children were taken prisoner. Miraculously, not a Texan was killed, and only a few bore wounds of the battle. Several hundred horses and much equipment, most of it from Linnville, accompanied the victors back to Austin.

Conclusion

Lamar's severe Indian policy produced mixed results. It did cost a great deal—in lives and money. But the campaigns of 1840 stopped, for the time being, all major Indian wars. The Comanches were impressed, now, with the growing ability of the Texans to defend themselves. But never again would the red man be as eager to treat for peace.

Wary now of pitched battles, the Comanches would step up their raids against isolated settlers on the frontier. For mass attacks, they turned their interests toward raids against poorly defended towns in Mexico.

When Sam Houston returned for a second term as president, he needed all his eloquence and powers of persuasion to bring the Comanches back around a council fire. On both sides, memories of 1840 burned bitterly as long as men lived.

From PIPE LINES to POWER LINES

KNOW where to use a comealong or baloney bender, how to help a clum some, or when to apply the right hand motor rule?*

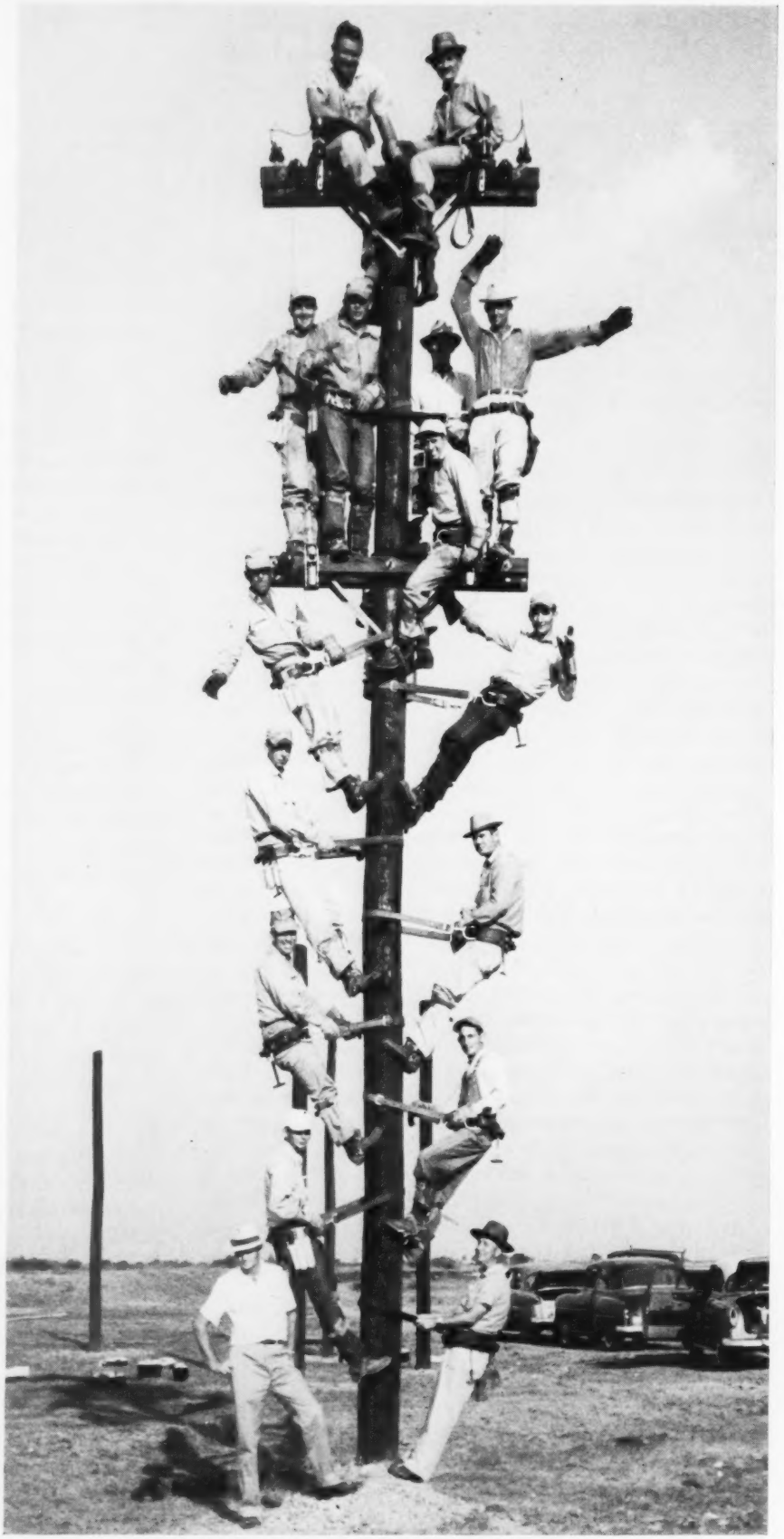
Pop these questions to any of the 15 men on the pole at right and they will snap out the answers in quick order. They are Humble Pipe Line Company employees who have recently graduated from the Company's new Communications and Electrical Indoctrination School—mercifully abbreviated to C&E School.

In two weeks of class and field work in Houston, these men studied the fundamentals of electricity. They worked with the tools, materials, and equipment associated with communications and electrical systems. Solving theoretical problems, they climbed poles like the one at right in regular practice sessions.

Object of the school was to give employees without previous electrical experience a working knowledge in the field along with the opportunity to apply this information in a new job with the Company. It represents another step in the Company's long-standing policy of "advancement from within." The 15 trainees selected to attend this first C&E school came from all five of the operating divisions of Humble Pipe Line Company.

After graduation, the trainees pictured here returned to their assigned work locations as Lineman's Helpers for a year's on-the-job training. During this time they will help keep the Company's communications lines and electrical pumping equipment in top working order—while learning more about their new trade. If progress is satisfactory at the end of 12 months, the trainees will be promoted to Lineman.

* Comealong—a wire stretcher; baloney bender—a cable worker; clum some—a green-horn lineman; right hand motor rule—the rule used to determine rotation direction of a motor.



Pole climbing graduates of Humble's C&E School are assigned job locations where they work on maintenance of communications, electrical pumping equipment.

GUARDIANS OF TEXAS HIGHWAYS

Vigorous training program helps Highway Patrol reduce heavy traffic toll

Watchful vigilance of Texas Highway Patrol is symbolized by Patrolman John Lynch of Austin District, graduate of 13th recruit school in 1948.

IT'S POSSIBLE you owe your life to a man you've never met.

He wears a blue and gray uniform and a .38-calibre revolver. Six days a week, in 10-hour stretches, he's the legal guardian of Texas highways. You slow down guiltily the moment you spot the tell-tale aerial and silver license plate on his car . . . because he's a Texas Highway Patrolman.

Yours is a natural reaction. But if these riders of the asphalt range had their way, you would drive safely as a matter of course, ruled by reason rather than fear of a ticket.

Last year, 2,547 people died on Texas highways. The toll will be as heavy this year unless Texans take it easy on speed and alcohol during the current holiday season.

There's no doubt that the Patrol is helping stop such senseless destruction of life and property. Take 1937, for instance. That year, 150 patrolmen were working the highways: 2,043 motorists died. That fall, the Patrol roster was almost doubled. In 1938, rural traffic fatalities dropped to 1,610.

Even in this age of two-car families and unbridled horsepower, the death rate per million-miles-traveled is the lowest ever. In the past 20 years, by lowering that rate, the Patrol has been chiefly responsible for preventing 27,584 citizens from committing suicide by auto.

Right now, there are 570 patrolmen striving toward a goal they will never accomplish: that of working themselves right out of a job. But 570 are not nearly enough, according to Col. Homer Garrison, director of the Department of Public Safety. Chief of Patrol W. J. Elliott and his staff are trying hard to attract additional recruits.

Competition is keen, and good men nowadays are hard to find, Chief Elliott will tell you. But as long as the spirit of adventure stirs young men, the Patrol's appeal will be strong. Here's why: The Texas Highway Patrolman is a special and sturdy breed in terms of intelligence, character and physical condition. He is willing to put his chance to serve above considerations such as working hours, starting rates of pay and advancement in rank. The veterans, many of them 20-year men, will tell you they wouldn't trade jobs with anybody!

Why? Well, for one thing there's that indefinable satisfaction of doing something useful—in this case, saving lives. In addition, the work is never dull—as if daily laying your life on the line could be. Patrolmen are on call 24 hours a day for anything from herding a cow from the highway to stopping prison breaks. They can handle a gun—but are faster on the draw with a word for safe driving.

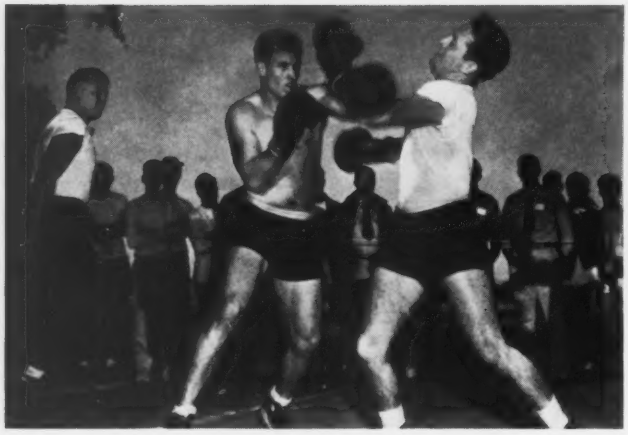
Patrolmen themselves will remind you, with a wry grin, that they are not the monsters they're often made out to be. They are family men who like a good cup of coffee and a funny story as well as the next fellow. And they are just as quick to fix a flat for a lady or carry gasoline for a stranded motorist as they are to issue a ticket to a habitual speeder.

Col. Garrison himself set up and helped teach the first patrol recruit school at Austin's Camp Mabry in 1930. Since then, 1,501 young men have completed the course and taken the oath. The training center was moved a year ago to the new Law Enforcement Academy on the grounds of the Department of Public Safety.

Chief Training Officer T. C. Laws says the Highway Patrol's unique *esprit de corps* stems from this tough, 11-week training schedule cadets go through. "Just as in the armed services," he says, "our men go through a lot together, in training and in the field. This develops such mutual respect that *esprit de corps* of the Patrol is almost legendary."

How Texas Highway Patrolmen Are Trained

Audio-visual apparatus improves patrol cadet's reading skill but good eyes are "must." Other requirements: 21-35 years old, high school graduate, 5-8 or taller, strong, active, well-proportioned and of high moral character.



Physical training is important—and enjoyable—part of cadet life. Patrol candidates study self-defense values of boxing, wrestling and judo. In Academy gym, there's room for basketball, rope-climbing and daily calisthenics.

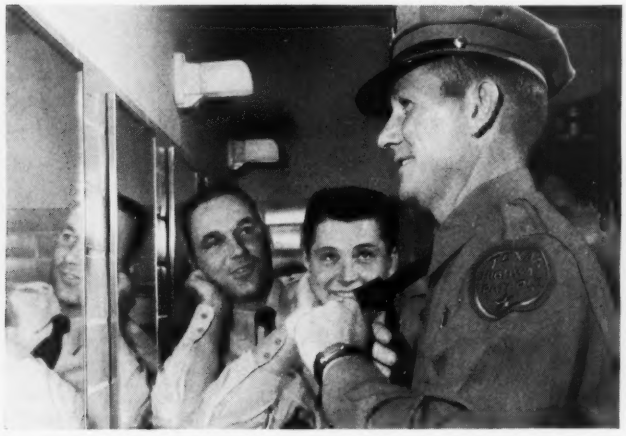
Motorcycle safety is taught candidates although nearly all Texas patrolmen use autos. Since most of work time is spent in car, officer must be expert driver, set example of highway safety; cadets undergo driving test over obstacle course.

Daily study in dorm room enables cadet to maintain fast pace of classroom. Living quarters at Academy are neat, well-lighted, air-conditioned. Each man shares room with three fellow recruits—roommates are shuffled bi-weekly.

Accident investigation is significant phase of training since patrolman is responsible for collecting all facts after routing traffic safely around accident scene. Here, khaki-clad trainees measure skid marks at mock collision.

Classroom lectures use five mornings a week in cadet's air-tight schedule. Recruits study everything from Texas history to human relations—90 subjects in all. Eleven-week course includes 567 training hours, equal to one year of college.

How to search armed and dangerous man is demonstrated to cadet platoon by sergeant-instructor. Patrol's golden rule: be courteous when you can, tough when you must, cautious at all times. In practice sessions, recruits get the idea.



Anxious candidate proudly tries out the new uniform issued him shortly before graduation day. Average cadet is 24 years old, 5-10 in height, weighs 170. He is a veteran, married, has one child. Most of course, are Texans.

Pistol practice is conducted in indoor Academy range and here, in chalk canyons near Austin. Expert gives pointers on FBI Practical Course—one which involves firing 50 fast rounds from assorted body positions and distances.

Graduation day arrives and cadets are sworn in, presented credentials by Col. Homer Garrison. Graduate has right to be proud—only one of nine original applicants make grade. After ceremony, patrolman begins six-month probation duty.

H. W. Ferguson

Ferguson Named API Vice President

H. W. Ferguson, director and vice president of Humble Oil & Refining Company, was elected the American Petroleum Institute's new vice president for refining at the organization's 36th annual meeting held recently in Chicago.

In his new position, Mr. Ferguson will be chairman of the General Committee of the API's Division of Refining. Last year he served as vice chairman of the same group.

The work of the Division of Refining committees, the papers presented at open sessions, and the exchange of information at meetings all serve to promote the art of refining and the solution of some non-competitive technical and operating problems in the refining industry.

Additional Contribution Totals $6,700,000

Humble Oil & Refining Company and Humble Pipe Line Company have announced an additional contribution of approximately $6,700,000 to the Thrift Fund accounts of participants in the Humble Annuity and Thrift plans.

The number of employees participating in the Thrift Plans is approximately 17,800 or about 99 per cent of those who are eligible.

This contribution is in addition to regular contributions made by the Company during the year to supplement savings of employees who participate in the Annuity and Thrift Plans. These Plans are a continuing part of Humble's employee relations program.

Employee participants in the Plans who retired during the 12-month period ending October 31, 1956, will also share in the additional contribution, as will participants who were on extended military leave during all or any part of the period.

Humble Pump Stations Reactivated

Nine Humble Pipe Line Company pump stations were reactivated and one new station put into operation during November and December to help transport increased volumes of crude oil from interior points of Texas to the Gulf Coast.

In the three systems where the expansion took place, throughput was increased by approximately 40 per cent.

Four pump stations on the Kemper to Harbor Island line were put into service, increasing throughput of this line by 50 per cent—up 30,000 barrels per day. Three stations on the West Texas to Houston area line were reactivated, increasing throughput by 60 per cent—up 50,000 barrels per day. In addition, one new pump station was put into operation and two older installations were reactivated on the North Texas to Houston area line—increasing throughput 35 per cent—up 18,000 barrels per day.

Ray H. Horton

Horton Elected New Chamber Director

Ray H. Horton, a director of Humble Oil & Refining Company, took office December 6 as one of eight new directors-at-large of the Houston Chamber of Commerce.

He was named to the position—along with seven other Houston business executives—by the Chamber's board of directors from an executive committee's nominating list of 16. Term of office is one year.

Mr. Horton has been active in Chamber of Commerce work for many years and has served as chairman and member of several committees.

Benzene Plant Scheduled For Refinery

One of the world's largest benzene plants will be built soon at Humble's Baytown Refinery. Construction on the project will start this year, with completion scheduled near the end of 1957.

The new unit—part of Humble's expansion program in the petrochemicals field—will be located on a 40-acre tract of land owned by the Company in the northwest section of the Refinery. An adjacent 40-acre tract is set aside for future expansion of petrochemical operations.

The plant is designed to produce about 24 million gallons of high purity benzene annually. Facilities will be integrated with operations of the Baytown Refinery, one of the world's largest, and the product will be transported by barge, tank car, and tank truck.

Output from the plant will be sold in the Gulf Coast area, where there is a large and growing demand for this basic chemical raw material.

Most of the benzene consumed in this area goes into the production of styrene, an ingredient of one type of synthetic rubber. It is used also in the manufacture of plastics, resins, detergents and insecticides.

Humble crews, who will build the off-site facilities, have already begun preparing the site for construction.

Bulk Station Being Built In Albuquerque

As part of an expanding sales program in New Mexico, Humble has begun construction on a bulk products terminal in Albuquerque. The plant is scheduled for completion in March, 1957.

Included in the plans is a combination warehouse-office building, six vertical storage tanks and a loading rack. The building will be 61 feet wide, 112 feet long and will have two floors. On the first floor of the office section will be the local manager's office, the general office, and a large meeting room. The second floor will contain six offices, rest rooms, and storage rooms.

Six cities will be served by the new terminal. They are Albuquerque, Santa Fe, Grants, Gallup, Las Vegas, and Socorro.

Humble Publications Win Awards

Humble publications received six awards recently at the Society of Associated Industrial Editors convention in Dallas. Two awards went to The Humble Way, two to the Humble Farm Family, and one each to the Humble Sales Lubricator and The Humble Bee.

An Award of Excellence—top award in its division—was won by The Humble Way, and Awards of Merit were won by the Lubricator and the Farm Family for general excellence in editorial content and appearance.

An Award of Excellence for the best article of the year was won by the Farm Family. And an Award of Merit was won by The Humble Way article, "Difficulties at Duck Lake."

In the industrial photography black and white competition, The Humble Bee won an Award of Merit.

Entered in the competition were 197 publications from Texas, New Mexico, Arizona, Oklahoma, Kansas, Missouri, Nebraska, Colorado, and Arkansas. Judging was done by House Magazine Institute, a New York City association of industrial editors.

Midland Office Building Expanded

Three additional floors are now being added to Humble's four-story office building in Midland.

Remodeling on the existing floors also will be necessary as a result of reassignment of office space.

The L-shaped structure, which was first opened in February, 1952, houses personnel from the Exploration Department, the Production Department, Sales Department, and Humble Pipe.Line Company.

Site of the building, with parking space for 120 cars, covers about half a block.

Junior Achievers Are Back in Production

These winsome young ladies are stockholders and employees of Metal Engineering, a Humble-sponsored Junior Achievement company. This year's MECO product is a lawn spreader, one of which is being assembled here by Mary Collerain, Pat Danna, Pat Guarin, Nancy Miller, and Carol Radenz.

40 Years With Humble

Walter B. Lowden, senior clerical supervisor in Stationery, Printing and Reproduction, completed 40 years of service with Humble October 28.

Recent Retirements

HUMBLE PIPE LINE COMPANY

Name	Location	Date of Retirement	Years of Service
Henry O. Campbell	Ballinger Station	November 24	32
Charlie N. Underwood	McCamey	November 8	27

PRODUCTION DEPARTMENT

Louie J. Barbe, Sr.	Hardin	December 18	27
Earl W. Daniel	Conroe	October 27	28
Elza Hatton	Conroe	December 6	32
Lee T. Shaw, Sr.	London	November 26	21
James F. Sims	Thompsons	December 7	33

BAYTOWN REFINERY

Walter A. Ash	Absorption Unit	November 10	28
William L. Havard	Distillation Dept.	November 11	30
Andrew S. May, Sr.	Dock Department	November 4	27
Albert C. Turner	Compound Dept.	December 18	28

HOUSTON OFFICE

Grady W. Davis	Civil Engineering	October 23	32
David E. Glenn	Purchasing Dept.	November 7	34
Bertha M. Guinn	Law Department	November 1	23
Frances S. Olsen	Land Records and Rentals	November 19	25

EMPLOYEE RELATIONS

William F. Spear	Safety Division at Baytown	December 19	28

Deaths

Employees: John M. Bertrand, 54, lease pumper-gauger at Hobbs, on October 25; James L. Foley, 57, chief operator at Baytown Refinery, on October 16; Charles H. Keen, 63, assistant division superintendent of Southwest Texas Division at Corpus Christi, on October 15; Troy M. Milam, 43, painter at Longview, on November 2; Ralph C. Nicholson, Jr., 26, assistant seismic computer in Geophysics Field, on October 15; Asbery W. Palmer, 63, roustabout at Friendswood, on October 20.

James A. Rhodes, Jr., 24, mail clerk in the Houston Office, on October 8; Walter P. Scott, Jr., 31 rotary helper at Greta, on November 13; Blaine Stephenson, 59, field gauger at Pampa, on November 12; Amos C. Yarbrough, 56, rotary driller at Lovell Lake, on October 27; Lloyd O. Zapp, 42, senior supervising civil engineer of Civil Engineering in Houston, on October 17.

Annuitants: Jacob M. Coffman, 75, former lease pumper-gauger at Conroe, on October 29; Frank A. Dolin, 77, former general accounting clerk in the Houston Office, on October 9; John A. Hicks, 85, former engineer at Burnett Station, on October 18; Thomas I. Hocut, Sr., 65, former lease pumper-gauger at Conroe, on October 11; Everett Hughes, 65, former special officer in North Texas Division, on October 7.

Behind this issue

● One of the fascinations for anyone writing about the oil business is the apt and colorful "slanguage" of the industry. Joe Tucker, assigned to write up the pipeliners' C&E School (page 18) was so intrigued by some of the terminology that he included it in the article. Some of the phrases—such as "baloney bender" to designate a cable worker—are so obvious as to require no explanation. But the name "clum some," applied to an inexperienced lineman, is more subtle. Yet it is really quite simple, as was pointed out by Clifton Campbell, of Humble Pipe Line Company's Communications and Electrical section.

"Years ago," Campbell explained, "the first question asked a man applying for a lineman job was whether he had ever had any pole-climbing experience. Often as not the applicant would reply: "I've clumb some." Before long, "clumb some" was shortened to "clum some," and became an accepted term in the lexicon of the industry.

● Staff photographer Mel Coston, who made the photographs of the Means Field (page 8), also brought back some pictures of an interesting little black-and-white dog named *Tong-Jaw*. The venerable canine, well-known throughout the Means District, has served for

years as mascot of Rig 32. He is, in fact, considered so much a part of the crew that he gets "transfer orders" when the rig moves, just like the other crew members. Tong-Jaw, who posed proudly for this picture with engineman Gordon J. Parker, has assumed full responsibility for greeting each crew member coming on tour. He is always on hand to give a welcoming wag of his tail and a toothy smile. To the men of Rig 32, old Tong-Jaw is a true and trusted friend. We thought they'd like to see his picture in the WAY.

● One of the minor problems in preparing this issue was the matter of proper attire for the Indians in the illustrations on pages 14-17. Artist Bob Schoenke, who drew the sketches, did considerable research before setting pen to paper. In all the books and photos in his reference library there was not a single picture of a Comanche wearing a full feathered headdress into battle. Mostly, they were shown with bandanas or headbands, some with a feather or two. So Schoenke sketched his Indians without feathered headdress.

But staff writer Frank Fields has spent so much time studying and writing about Texas history that he has a feeling for such details. And he felt that Comanches did wear the full headdress. Digging deep into his own reference books Fields came up triumphantly with an old photograph which proved his point. Schoenke yielded and the Comanche on page 17 got his headdress.

● Probing into the State Archives for material on the Indian fights, writer Fields also found an item of more than usual personal interest. It was a newspaper account in an 1840 issue of the *Austin City Gazette* describing a scrap between Indians and Texans near Gonzales. A Texan named Kelso was praised for his part in the battle. Since Frank Fields' home town is Gonzales, and some of his relatives are named Kelso, he was intrigued into doing some further investigation. Sure enough, he found that the Indian-fighting Kelso was his great-great uncle.

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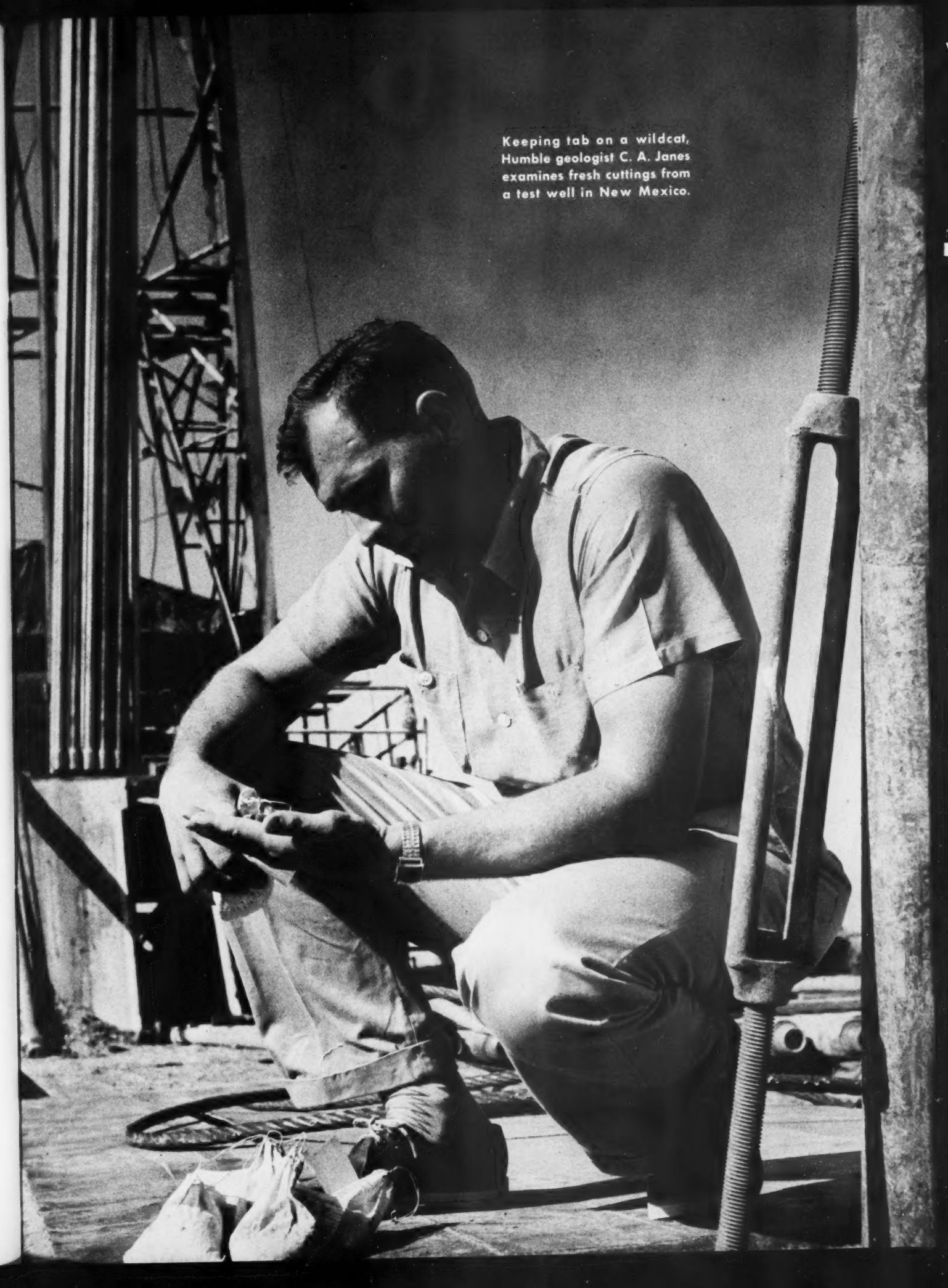

Keeping tab on a wildcat, Humble geologist C. A. Janes examines fresh cuttings from a test well in New Mexico.